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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,394	01/11/2002	Kenneth M. Wilson	10012382-1	9298
7590 10/19/2004 HEWLETT-PACKARD COMPANY Intellectual Property Administration P.O. Box 272400 Fort Collins, CO 80527-2400			EXAMINER HO, THANG H	
			ART UNIT 2188	PAPER NUMBER

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/044,394

Applicant(s)

WILSON ET AL.

Examiner

Thang H Ho

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,5-14,17-24 and 27-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-14, 17-24, 27-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office Action is in response to applicant's amendment dated June 17, 2004. The applicant's remarks and amendment were considered with the results that follow.
2. Claims 1-32 are pending in this application for examination. Claims 1-2, 5-6, 9-14, 17-18, 20-24, 27-28 and 30-32 have been amended, claims 3-4, 15-16 and 25-26 have been cancelled and claims 33-35 have been added. Therefore, claims 1-2, 5-14, 17-24, 27-35 remain pending in the application.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 1-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is unclear what the limitation of "realistic time" is referring to. Specifically, no definition has been given to "realistic time".

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2, 5, 13-14, 17, 23-24, 27 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes (United States Patent 5,784,582) and Frank et al. (United States Patent 5,297,265), hereinafter Frank.

Hughes discloses a system and method for managing access latency by prioritizing memory access requests among a plurality of data paths based on configuration parameters, wherein the configuration parameters comprise location, size and direction of the transfer in combination with information of the current request.

As per claims 1-2, 5, 23-24, 27, 33 and 35, Hughes teaches the system and method substantially as claimed comprising the steps of: upon accessing the memory system for a piece of data used by a first process [i.e., request] determining an access time to acquire the piece of data in the memory system; comparing the determined access time to a threshold [i.e., comparing the size and location of the request to determine the time it takes to process the request and prioritize the request accordingly (Figure 3; column 5, lines 46-48)]; and taking actions based on the results of the comparing step; wherein a value of the threshold is elected based on whether the value is a realistic time for a memory access [Due to 112 rejection above with regarding to the limitation of “realistic time”, Examiner is hereby interpret “realistic time” as being a function of size,

location, and/or direction; Hughes teaches that the requests are being prioritized according to its size, location, and direction (Figure 4; column 2, lines 10-43; column 5, line 63 through column 6, line 5; and column 6, lines 46-49)]. However, Hughes does not specifically teach using a memory table having entries to convert a location address corresponding to an entry pointing to the location of the piece of access data, wherein the memory table working with a memory manager managing the data blocks independent of an operating system working with the memory system and independent of a processor working with the memory system. Frank teaches a system and method for using a memory table [i.e. cache directory] to convert a location address corresponding to an entry pointing to the location of the piece of access data [see Figure 5 and column 11, line 23 through column 12, line 68]. Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to implement the system and method for managing a memory system as taught by Hughes and to utilize a memory table as taught by Frank to improve data coherency, which requires little or no software overhead, as well as reducing memory access latency and bus contention providing a multiprocessing system with unlimited scalability as pointed out by Frank on column 2, line 27 through line 37.

**As per claims 13-14, 17 and 34,** the claims are directed to a computer readable medium carrying instructions, which perform the steps of implementing the process of claims 1-2. Hard drives and memories are computer readable mediums in addition to CD-ROMs, floppy disks, etc. Hughes teaches a computer implemented process, thus it is

inherent that the program accomplishing the procedures must be carried or stored on a computer readable medium to enable the computer to function in the manner taught by Hughes.

7. Claims 6-8, 11, 18-19, 21, 28-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamberts (United States Patent 6,418,510) and Eickemeyer et al. (United States Patent 6,049,867), hereinafter Eickemeyer.

**As per claims 6-8, 11, 28-29 and 31** Lamberts teaches the method for managing a memory system substantially as claimed including the steps of comparing the time taken to complete the memory access to a threshold [i.e. determining whether to overwrite data based on the estimated access time (see Figure 3 and Figure 4)]; and taking an action based on result of the comparing step [i.e., data with higher access time is added or kept in the cache while data with lower access time is not stored in the cache]; a value of the threshold being selected based on whether the value is a realistic time for a memory access [Due to 112 rejection above with regarding to the limitation of “realistic time”, Examiner is hereby interpret “realistic time” as being a function of access time. Lamberts teaches that data access is being compared to a threshold value wherein data with higher access time is added or kept in the cache while data with lower access time is not stored in the cache (Figure 3, references 64, 68, 70 and 72; Figure 4, references 96, 100, 102 and 104); column 4, lines 29-55]. However, Lamberts does not specifically teach the method of accessing the memory system for a piece of data used by a first process, a processor working with the memory system continuing its functions until it is

stalled. Eickemeyer teaches a system and method for memory management to reducing memory access latency utilizing a process or thread switch to allow the switching between multiple threads in response to the occurrence of an event such as a cache miss or stall that indicates long memory latency may occur. In an event of a cache miss, a first thread is suspended allowing a second thread to access the cache memory [Abstract, column 4, lines 27-55; and column 5, lines 4-7]. Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to implement the system and method for managing a memory system as taught by Lamberts and incorporate Eickemeyer's teachings to include a process switch to postpone of a current process and allow a second process to execute in an event of a cache miss. One skilled in the art would have been motivated to do so, because the utilization of a process switch provides further memory access latency reduction and eliminates the need for complex, replication of pipeline latches and pipeline states rendering a cost-effective system as pointed out by Eickemeyer on column 4, line 27 through 55.

**As per claims 18-19, and 21,** the claims are directed to a computer readable medium carrying instructions, which perform the steps of implementing the process of claims 6-8. Hard drives and memories are computer readable mediums in addition to CD-ROMs, floppy disks, etc. Lamberts teaches a computer implemented process, thus it is inherent that the program accomplishing the procedures must be carried or stored on a computer readable medium to enable the computer to function in the manner taught by Lamberts.

8. Claims 9-10, 12, 20, 22, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamberts (United States Patent 6,418,510) and Eickemeyer et al. (United States Patent 6,049,867), hereinafter Eickemeyer as applied to claims 6, 11, 18, 21, 28 and 31 above, respectively, and further in view of Frank et al. (United States Patent 5,297,265), hereinafter Frank.

As per claims 9-10, 12, 30 and 32, Lamberts and Eickemeyer teaches the system and method as recited as detailed above. However, neither Lamberts nor Eickemeyer teaches the usage of a memory table having entries to convert a location address corresponding to an entry pointing to the location of the piece of access data, wherein, while the first process is being executed, the memory table working with a memory manager managing the data blocks independent of an operating system working with the memory system and independent of a processor working with the memory system. Frank teaches a system and method for using a memory table [i.e. cache directory] to convert a location address corresponding to an entry pointing to the location of the piece of access data [see Figure 5 and column 11, line 23 through column 12, line 68]. Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to implement the system and method for managing a memory system as taught by Hughes and to utilize a memory table as taught by Frank to improve data coherency, which requires little or no software overhead, as well as reducing memory access latency and bus contention providing a multiprocessing system with unlimited scalability as pointed out by Frank on column 2, line 27 through line 37.

**As per claims 20 and 22**, the claims are directed to a computer readable medium carrying instructions, which perform the steps of implementing the process of claims 9-10. Hard drives and memories are computer readable mediums in addition to CD-ROMs, floppy disks, etc. Lamberts teaches a computer implemented process, thus it is inherent that the program accomplishing the procedures must be carried or stored on a computer readable medium to enable the computer to function in the manner taught by Lamberts.

#### ***Response to Arguments***

9. Applicant's arguments with respect to claims 1-2, 5-14, 17-24, 27-35 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thang H Ho whose telephone number is 571-272-4206. The examiner can normally be reached on Monday-Friday from 7:00 A.M. - 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thang Ho  
Art Unit 2188  
October 15, 2004

*Mano Padmanabhan*  
10/17/04

**MANO PADMANABHAN  
SUPERVISORY PATENT EXAMINER**